

US-PAT-NO: 4275369

DOCUMENT-IDENTIFIER: US 4275369 A

TITLE: Filter for microwaves

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Detailed Description Text - DETX (1):

FIG. 1 is a circuit diagram of a double superhetereodyne tuner having a microwave filter. The tuner includes an antenna 1, an amplifier 2, a first mixer 3, a variable oscillator 4, a first intermediate frequency filter 5 made up of a filter for microwaves, a second mixer 6, a fixed oscillator 7, a second intermediate frequency filter 8, a second intermediate frequency amplifier 9, an output terminal 10, a distributor 11, a distributor 12, a synthesizer 13, a phase locked loop (PPL) mixer 14, a low-pass filter 15, a PLL block 16, an IC board 17, an IC board 18, and an IC board 19.

Detailed Description Text - DETX (2):

The IC board 17 includes the circuits necessary to add the input signals from the antenna 1 to the amplifier 2, to mix in the first mixer 3 the output of the amplifier with a portion of the output of the variable oscillator 4 distributed by the distributor 11, and to direct the resulting mixed output of the mixer 3 to the first intermediate frequency filter 5.

Detailed Description Text - DETX (3):

The IC board 18 includes the circuits necessary to mix, by way of the second mixer 6, the first intermediate frequency signals leaving the first intermediate frequency filter 5 together with a portion of the output of the fixed oscillator 7 distributed by the distributor 12, to direct the mixed output to the second intermediate frequency filter 8, and to amplify by means of the amplifier 9 the second intermediate frequency signals produced by the second intermediate frequency filter 8 thereby to produce the amplified output at the terminal 10.

Detailed Description Text - DETX (4):

The IC board 19 includes the circuits necessary to

synthesize, by means of the synthesizer 13, a portion of the output of the variable oscillator 4 distributed by the distributor 11 in the IC board 17 and a portion of the output of the fixed oscillator 7 distributed by the distributor 12 in the IC board 18. Further, the IC board 19 has circuitry to convert the output of the synthesizer 13 through the PLL mixer 14, and to select, from the converted output and by means of the low-pass filter 15, only low frequencies corresponding to the limiting frequency of a frequency divider incorporated in the PLL block 16, as will be described more fully below. The IC board 19 also includes circuitry to pass the output of the low-pass filter 15 to the PLL block 16 to thereby control the variable oscillator 4 in the IC board 17.

Detailed Description Text - DETX (7):

A double superheterodyne tuner can therefore be obtained by connecting the abovementioned IC boards 17, 18 and 19 with the first intermediate frequency filter 5, which serves as a microwave filter, as illustrated.

Detailed Description Text - DETX (10):

Further, a coupling window 37 is formed in the housing wall 35 between the resonator cavity 32 and the resonator cavity 33, and a coupling window is also formed in the housing wall 36 between the resonator cavity 33 and the resonator cavity 34. Coupling loops 38 are disposed in the resonator cavity 32 and in the resonator cavity 34, whereby the resonator cavities are coupled by means of the coupling windows 37 and the coupling loops 38. Furthermore, as shown in FIG. 3B, the bottom wall 31a is provided with a hole 39 communicating with the coupling window 37 of the wall 35, and, although not shown in the drawings, a similar hole in the bottom wall 31a communicates similarly with the coupling window in the housing wall 36. In the resonator cavities 32 and 34, a hole 40 is formed in the bottom wall 31a and is positioned outside of the respective holes communicating with the walls 35 and 36. A groove 41 is formed in the side wall 31b and the coupling loop 38 runs through the hole 40 and the groove 41. Reference numerals 17, 18 and 19 represent IC boards corresponding to the IC boards having the same reference numerals FIG. 1.

The input signals from the IC board 17 are introduced from the coupling loop 38 on the right side of FIG. 3A, and are subsequently fed to the IC board 18 through the coupling loop 38 located on the left side. Reference numeral 42 denotes connection lines connecting the IC boards together.